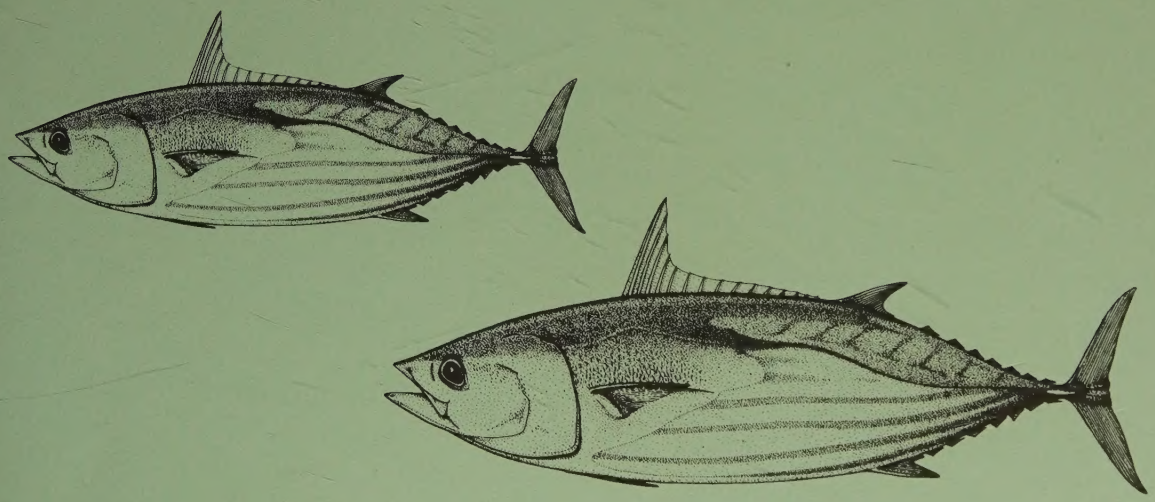
August 1974
No. 8

FISHING INFORMATION

Southwest Fisheries Center-La Jolla, California



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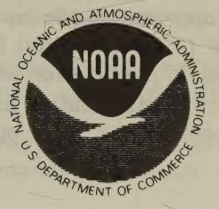
U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES CENTER
8604 LA JOLLA SHORES DRIVE - P. O. BOX 271
LA JOLLA, CALIFORNIA 92037

FISHING INFORMATION

AUGUST 1974 , No. 8



B. J. Rothschild, Director,, SOUTHWEST FISHERIES CENTER
I. Barrett, Deputy Director
R. Shomura, Director, Honolulu Laboratory

PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) a narrative description of subsurface temperature structure for parts of the North Pacific, 4) charts of winds and pressures for the eastern North Pacific, 5) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 6) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. This is a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

L. E. Eber, Leader
Fishery Information Systems
Southwest Fisheries Center
La Jolla, California

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L. Eber (Figures 4 and 6)
F. Miller (Figures 8 and 9)
J. Renner (Figures 1,2,3,5,7, and 15-day Supplement)
J.F.T. Saur (Figures 10, 11, and 12)

TECHNICAL EDITOR:
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Expendable bathythermograph and salinity observations are made by the mates and engineers of the S.S. Hawaiian Enterprise, S.S. Hawaiian Queen, and S.S. Californian, of Matson Navigation Co. The data are processed under supervision of D.R. McLain at the NMFS Pacific Environmental Group, Monterey, using computer facilities of the Fleet Numerical Weather Center. The project is partially supported by the National Science Foundation and the Office of Naval Research under Government Order NAonr-9-74.

Sea Surface Temperature and Environmental Conditions

L. EBER AND F. MILLER

Eastern North Pacific

Seasonal warming of sea surface temperatures during August 1974 was below normal along the North American west coast south of 45°N over a large region extending from southern and Baja California towards Hawaii and also between 35°-45°N and 165°-175°W. Above-normal warming occured in the Gulf of Alaska and also in an area to the west and northwest of Hawaii.

The below-normal warming intensified anomalous cool conditions that already existed along the U.S. west coast and over a region stretching between Baja California and Hawaii. It also caused a slight northward spreading of below-normal temperatures south of the Aleutian Islands. Above-normal heating allowed temperatures in the Gulf of Alaska to rise to above-normal values except along the Canadian coast and also increased the anomalous warm conditions west and north of Hawaii that have existed since December 1973.

Atmospheric pressure conditions during August were characterized by a ridge of high pressures located between the coast and 149°W longitude, strong pressure gradients along the U.S. coast south of 45°N, and below-normal pressures over most of the eastern North Pacific west of 140°W. These conditions resulted in strong north-northwesterly winds along the coast throughout the month and also an anomalous counterclockwise circulation with northerly winds west of 160°W and southerly winds between 160° and 140°W longitudes.

Heat exchange processes related to the wind regime account for most of the deviations from the normal change in sea surface temperatures. In regions of anomalous southerly flow, seasonal warming was accelerated through transport of warm water northward and reduced heat loss by evaporation. The opposite effect occurred in areas with anomalous northerly winds due to transport of cold water southward and increased heat loss by evaporation. Year-to-year variations in the amount of cloud cover also influence the amount of solar radiation reaching the sea surface. Much above-normal cloud cover between the North American coast and the Hawaiian Islands contributed to the retardation of seasonal warming in this area, while below-normal cloud cover contributed to the increased rate of warming west of Hawaii.

Western North Pacific

The large area of relatively cool surface water that formed in the central sector of the western North Pacific last month persisted throughout August 1974. However, the largest negative anomaly values decreased by 2°F (1.1°C) and shifted northward from between 35°-40°N to 40°-45°N. Temperature values that were either below or only slightly above normal during July increased to 1°-2°F (0.6°-1.1°C) above normal over a relatively large area east of Japan and southeast of the Kuril Islands. Surface temperatures also increased to above-normal values during August south of Japan and over most of the Philippine Sea.

Eastern Tropical Pacific

During July and August sea surface temperatures normally decrease an average of 2°F (1.1°C) in and adjacent to the Peru current and from the equator to 5°S east of 110°W. Elsewhere in the southern hemisphere temperatures decrease only slightly. However, in the northern hemisphere tropics temperatures increase slightly. Along the coast of Baja and out to 130°W sea temperatures are expected to increase 2°-4°F (1.1°-2.2°C) during both July and August in association with light winds, decreased cloud cover and an increase in surface heating.

In August 1974 sea surface temperatures were very close to the long-term mean temperatures over most of the equatorial Pacific between 5°N and 5°S east of 140°W. To the west of 140°W and near the equator, temperatures remained below normal where upwelling was probably active (Figures 8 and 9). Between the Galapagos Islands and 85°W the equatorial ocean front pushed northward creating a 2°F (1.1°C) negative anomaly. From 85°W to the coast of Ecuador the front shifted south of its mean position and warmer than normal surface temperatures occurred. In this area the temperature gradient across the equatorial front was stronger than normal for August (Figure 8).

In the northern hemisphere between 8°N and 20°N negative temperature anomalies of greater than 2°F (1.1°C) continued to expand in the region between 95°W and 145°W where tropical storms were very active in the last 10 days of August 1974. During this period three hurricanes and two tropical storms were observed on August 26, 1974 by the NOAA-3 satellite to be active in the eastern tropical Pacific over the tuna fishing grounds. Tropical storm activity of this frequency is rare, but the effects of high winds and heavy cloud cover for less than one half of the month between 10°N and 20°N east of 140°W can be seen in Figure 9 which shows large areas of negative temperature anomalies greater than 2°F (1.1°C). Sea temperatures over the fishing grounds off southern Baja California warmed at a slower rate than would be expected partly because of the heavier cloud cover and slightly stronger winds than normally associated with tropical storm activity south of Baja.

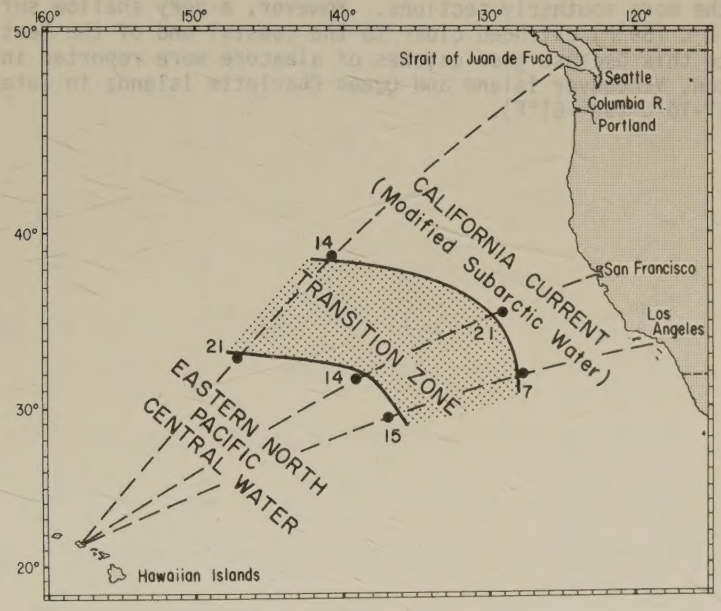
Subsurface Temperature Structure in the Northeast Pacific Ocean

J.F.T. Saur

Three subsurface temperature sections are presented in this issue, each along a different ship route between Hawaii and the U.S. west coast: Figure 10, Honolulu - Seattle; Figure 11, Honolulu - San Francisco; and Figure 12, Honolulu - Los Angeles. The observations for the San Francisco section were made in mid-August, while those for the other two were taken in the latter part of July. For the newly introduced Honolulu - Seattle section observations are made only between Makapuu Pt., Oahu, and the entrance to the Strait of Juan de Fuca.

For previously published San Francisco and Los Angeles sections we have delineated three "water masses" according to the vertical temperature structure and the surface temperature and salinity characteristics. From the coast toward Hawaii these are (1) the modified Subarctic water in the California Current region, (2) a Transition Zone and (3) the Eastern North Pacific Central water. The observations on the Seattle route have been initiated to provide information on the location of these water masses to the north and west of the other two routes.

The regions occupied by the water masses in late July and early August 1974, are shown in the chart below.



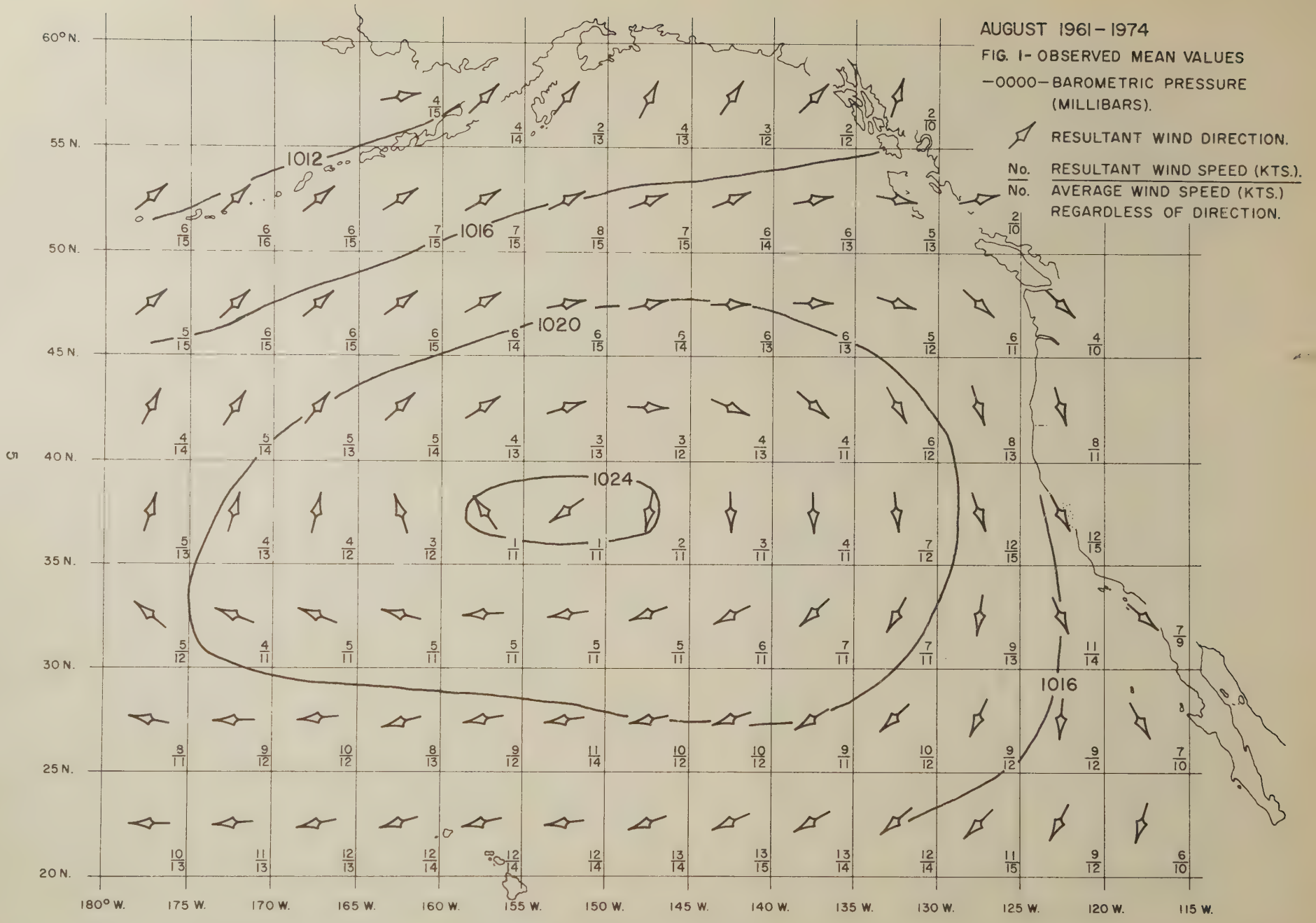
Between the Seattle route and the San Francisco route the orientation of the water mass boundaries is much more east-west than between the San Francisco and Los Angeles routes. This change in orientation is related to the change in direction of the currents: that is, the turning of the eastward moving North Pacific Current into the southeasterly and southerly moving California Current.

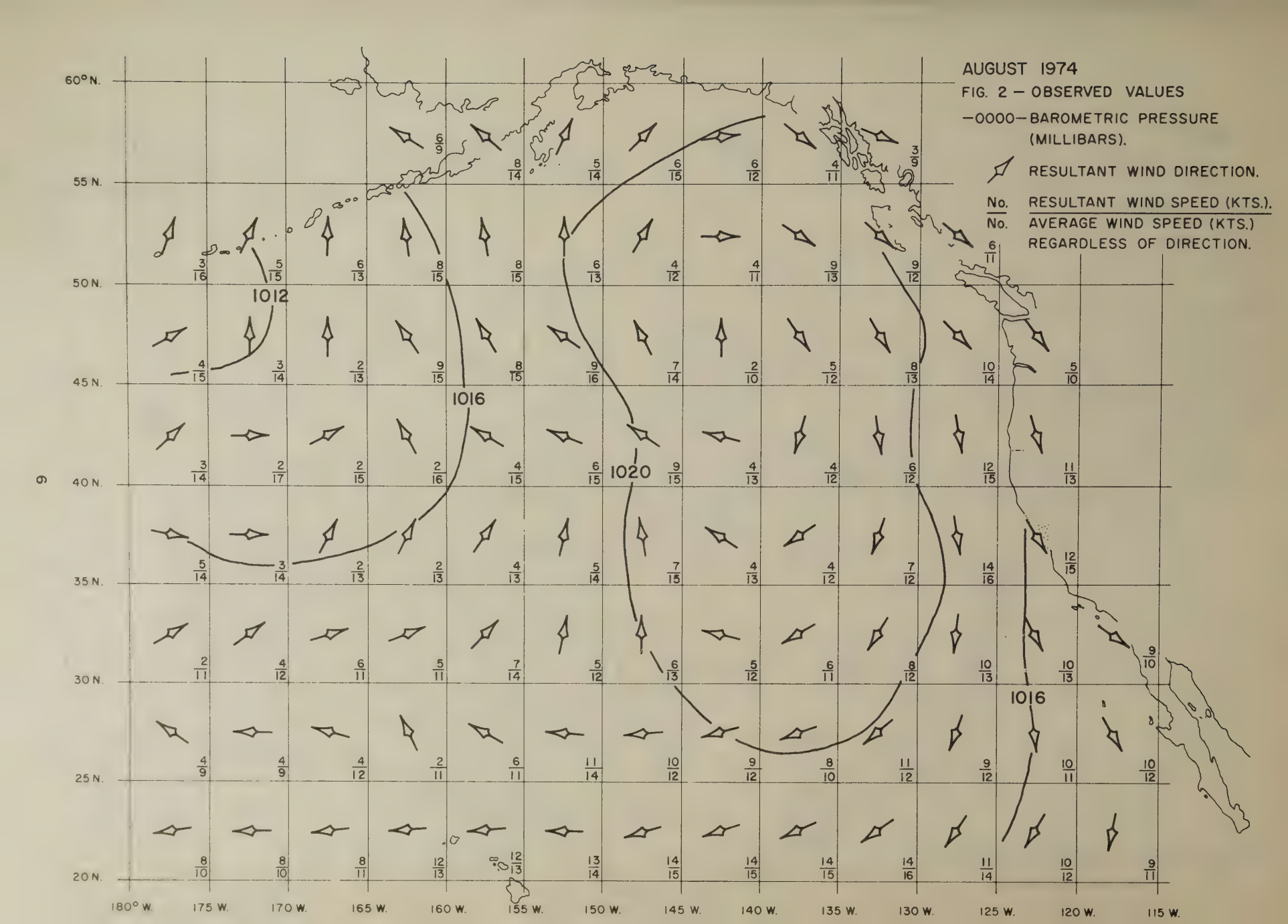
In the chart above, the number of the observation on each side of the Transition Zone is shown so that the reader may note the characteristic features of each region in the several parts of Figures 10, 11, and 12. In the vertical temperature profiles one can see the contrast between the shallow-sharp thermoclines in the modified Subarctic water of the California Current and the deeper broader thermoclines in the region occupied by the Eastern North Pacific Central waters. Surface salinities of 33.5‰ and surface temperatures of about 18°C (64°F) occur at the southwest limit of California Current. The northeast limit of the Eastern North Pacific Central waters occurs where surface salinities drop below 34.8‰ and surface temperatures below 21-22°C (70-72°F).

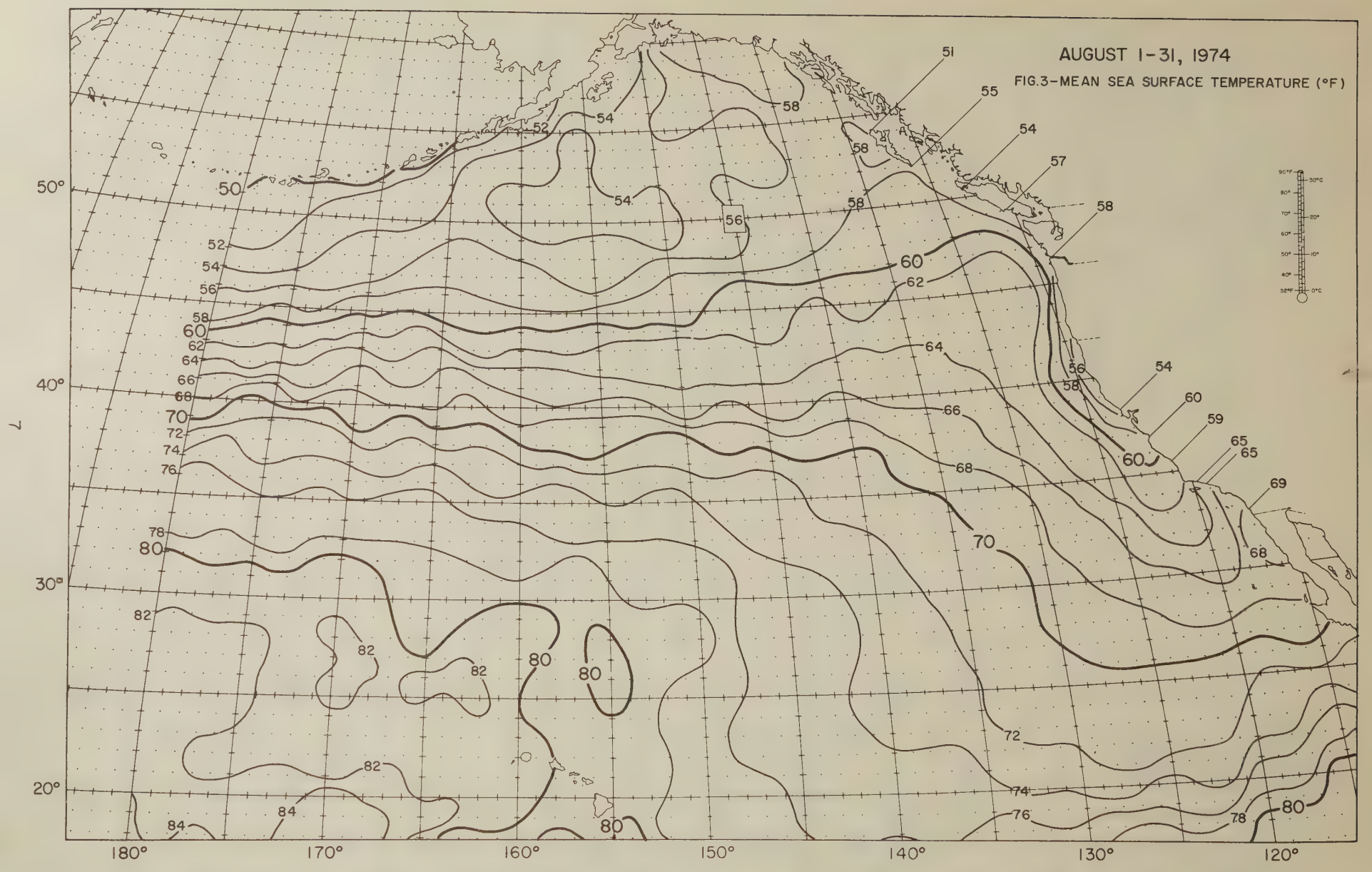
In the north-south direction there are two readily apparent differences between conditions on the Seattle route (Figure 10) and those on the two more southerly routes. Both are related to the lowering of salinity of surface waters by precipitation and fresh water run-off north of about 40°N. On the Seattle route surface salinity at the two stations closest to the coast decreases to below 32‰, whereas on the San Francisco (Figure 11) and Los Angeles (Figure 12) routes the surface salinity rises when approaching the coast due to upwelling effects. On the Seattle route because downward mixing is inhibited by stability of the surface layers in the modified Subarctic waters, the heat entering the ocean in summer is trapped near the surface creating shallower and much steeper thermoclines than are found in the modified Subarctic waters of the California Current on the San Francisco and Los Angeles routes.

Following the established procedure the 16°-19°C (60°-66°F) temperature zone is shaded in the vertical sections so that its seasonal movements can be followed in relation to albacore catches. On the Los Angeles route the surface intersection of this zone lay in the California Current region, between 121° and 130°W longitude. In this area the depth of the zone increased from 40 m on the east to almost 100 m on the west. On the San Francisco route the surface intersection was also located in the California Current region but had moved eastward during the period from early July to mid-August to almost 100 miles from the coast and lay between 125° and 131°W. In this area the zone was generally less than 50 meters deep.

In the Seattle section the intersection of the 16°-19°C (60°-66°F) temperature zone with surface occurred mostly in the modified Subarctic water but was much farther from the coast (136°-143°W) than on the more southerly sections. However, a very shallow surface layer with temperature of about 15°C (59°F) extended clear to the coastal end of the Seattle section (made in late July). We note this because good catches of albacore were reported in August close to the coasts of Washington, Vancouver Island and Queen Charlotte Islands in waters with surface temperatures around 15°-16°C (59°-61°F).

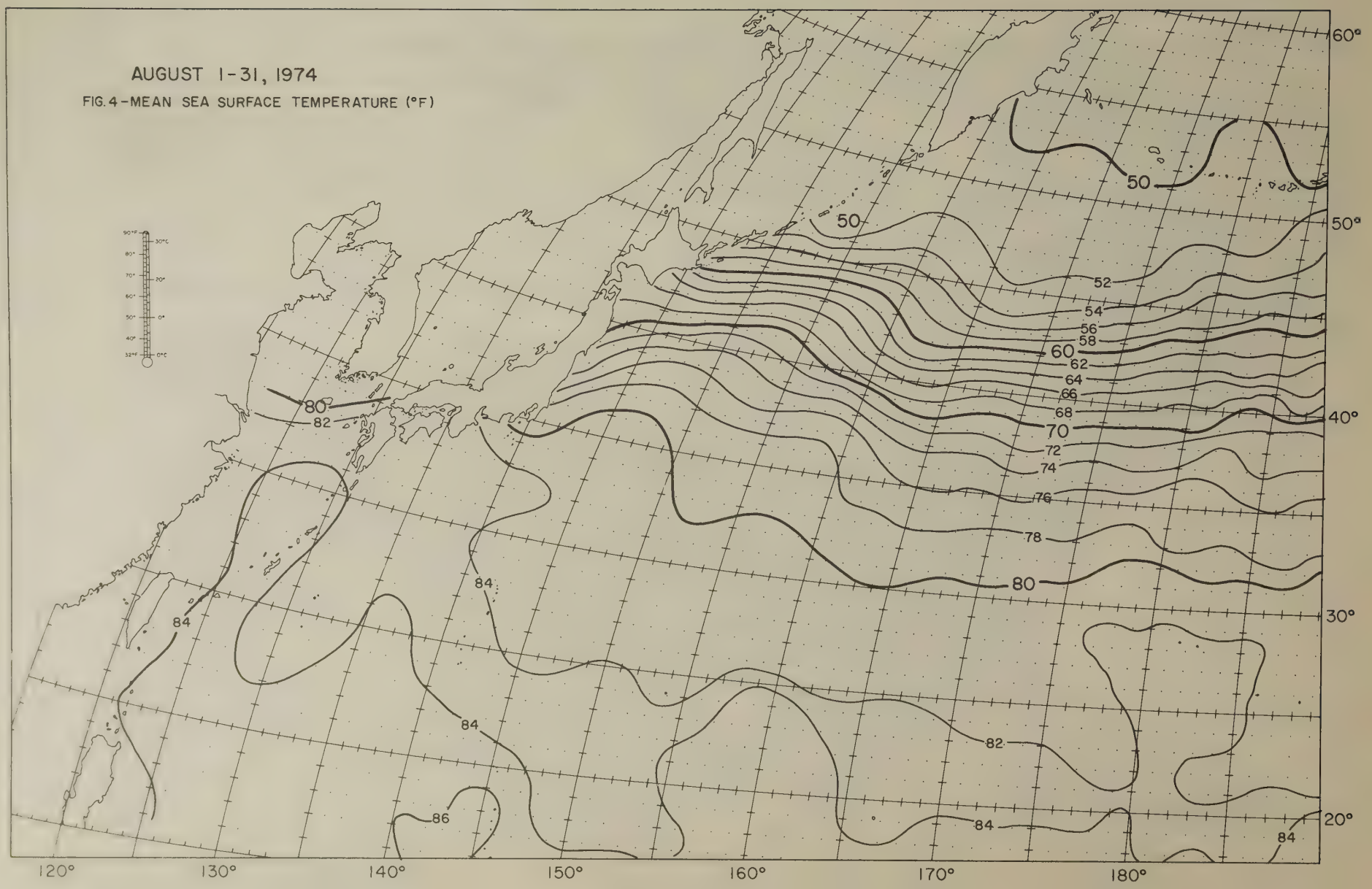

AUGUST 1961 – 1974
FIG. 1- OBSERVED MEAN VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1012
1016
1020
1024
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

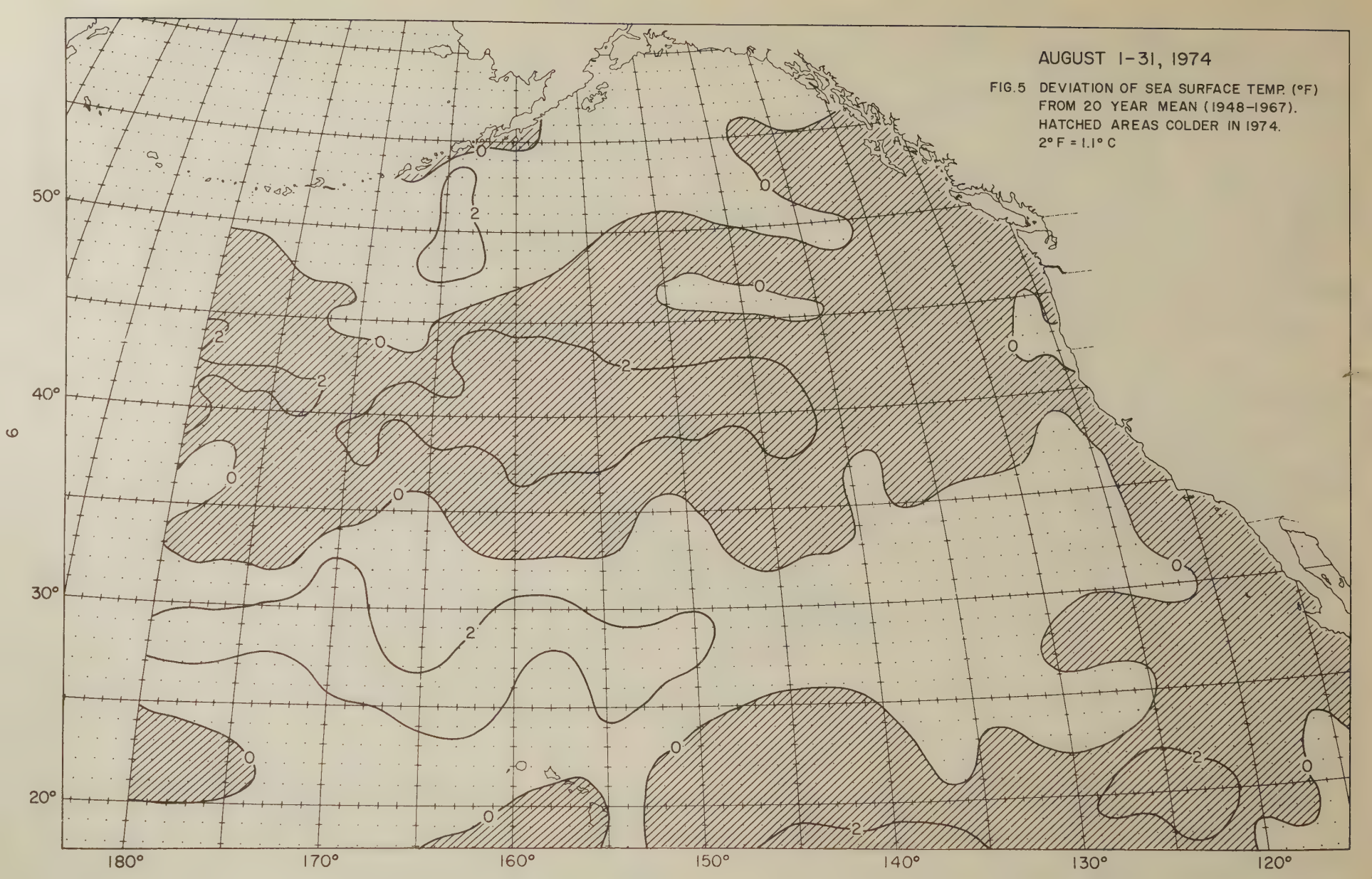

AUGUST 1974
FIG. 2 — OBSERVED VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1012
1016
1020
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

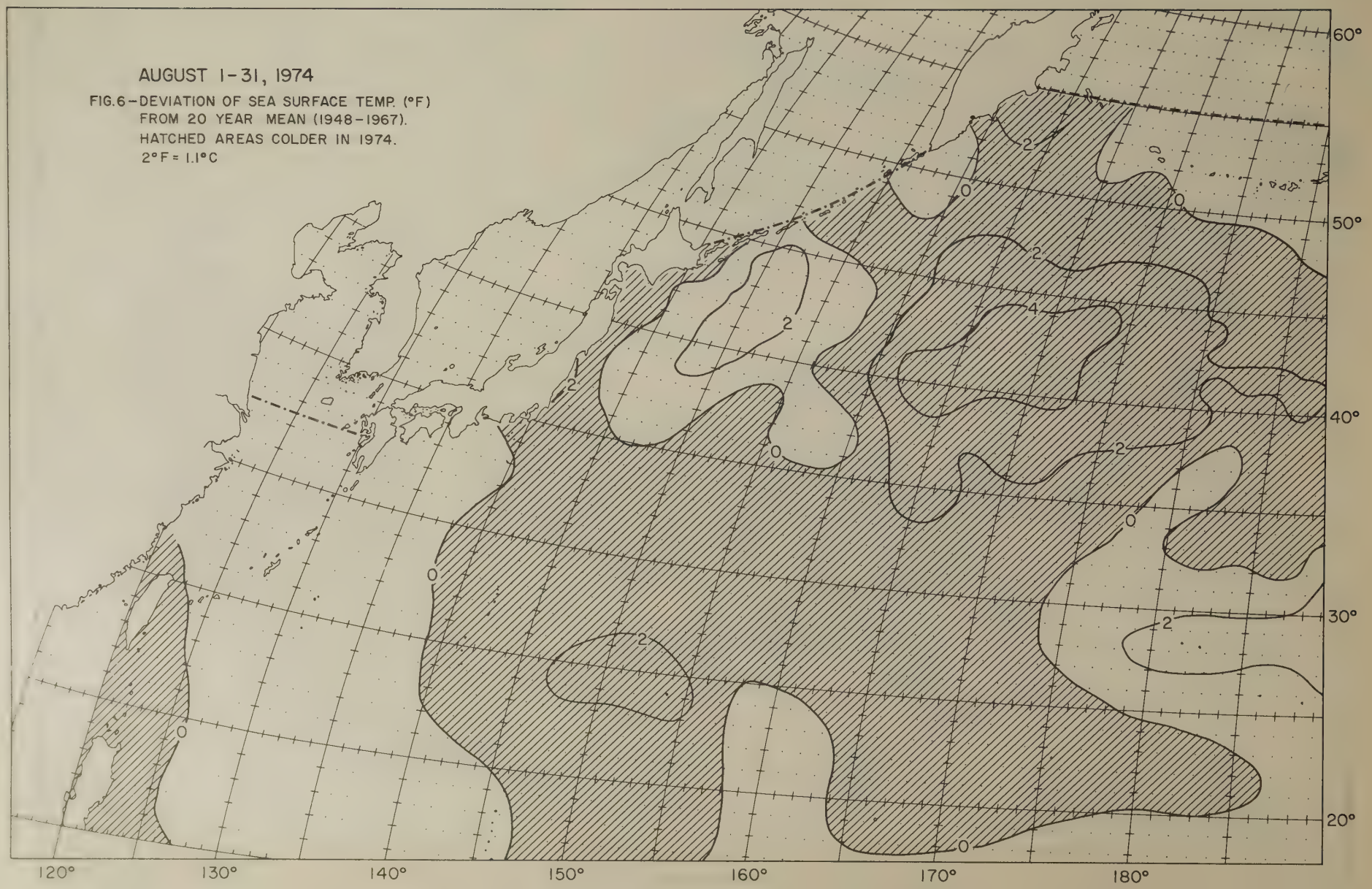

AUGUST 1-31, 1974
FIG.3-MEAN SEA SURFACE TEMPERATURE (°F)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°

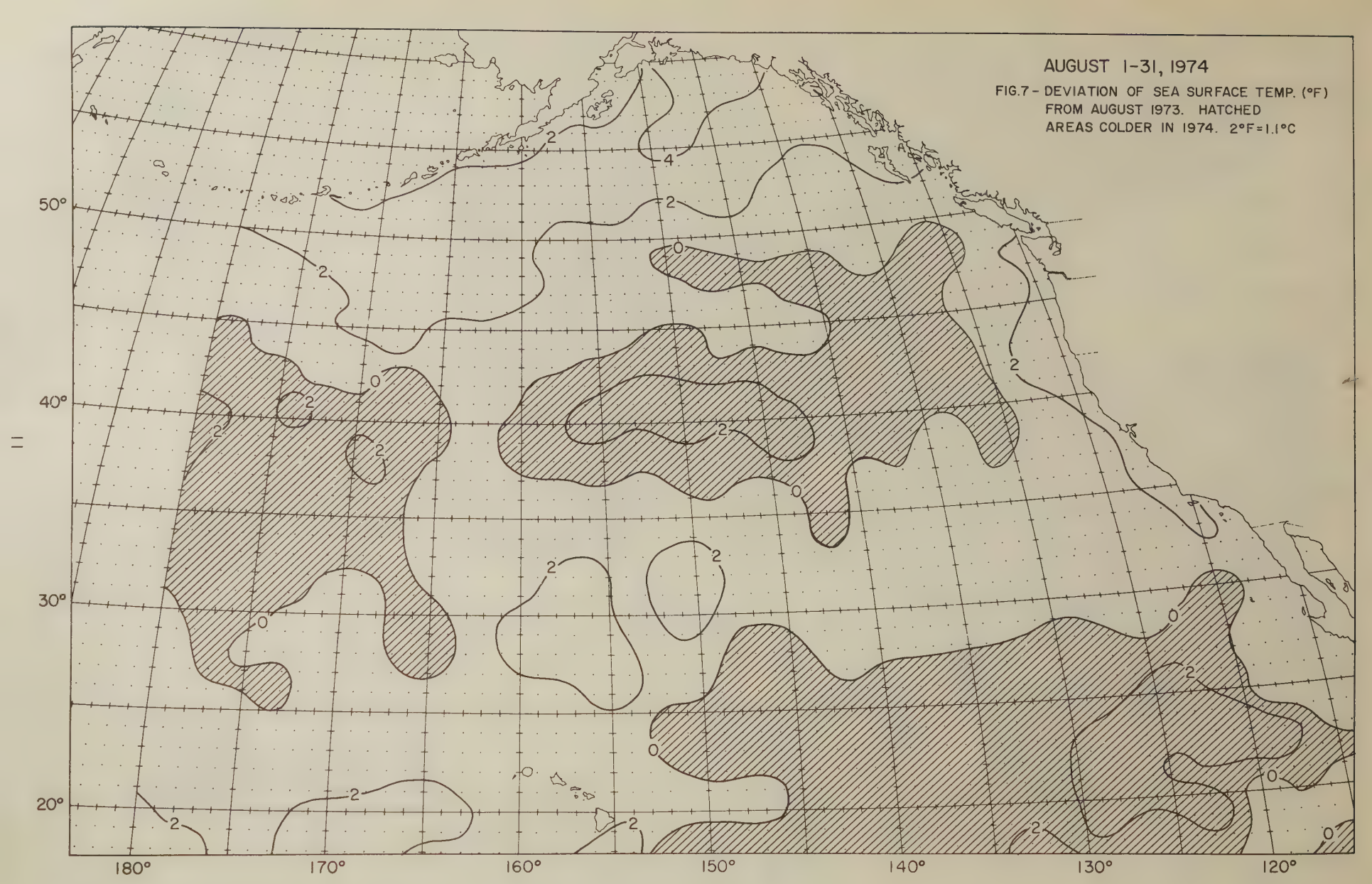
AUGUST 1-31, 1974

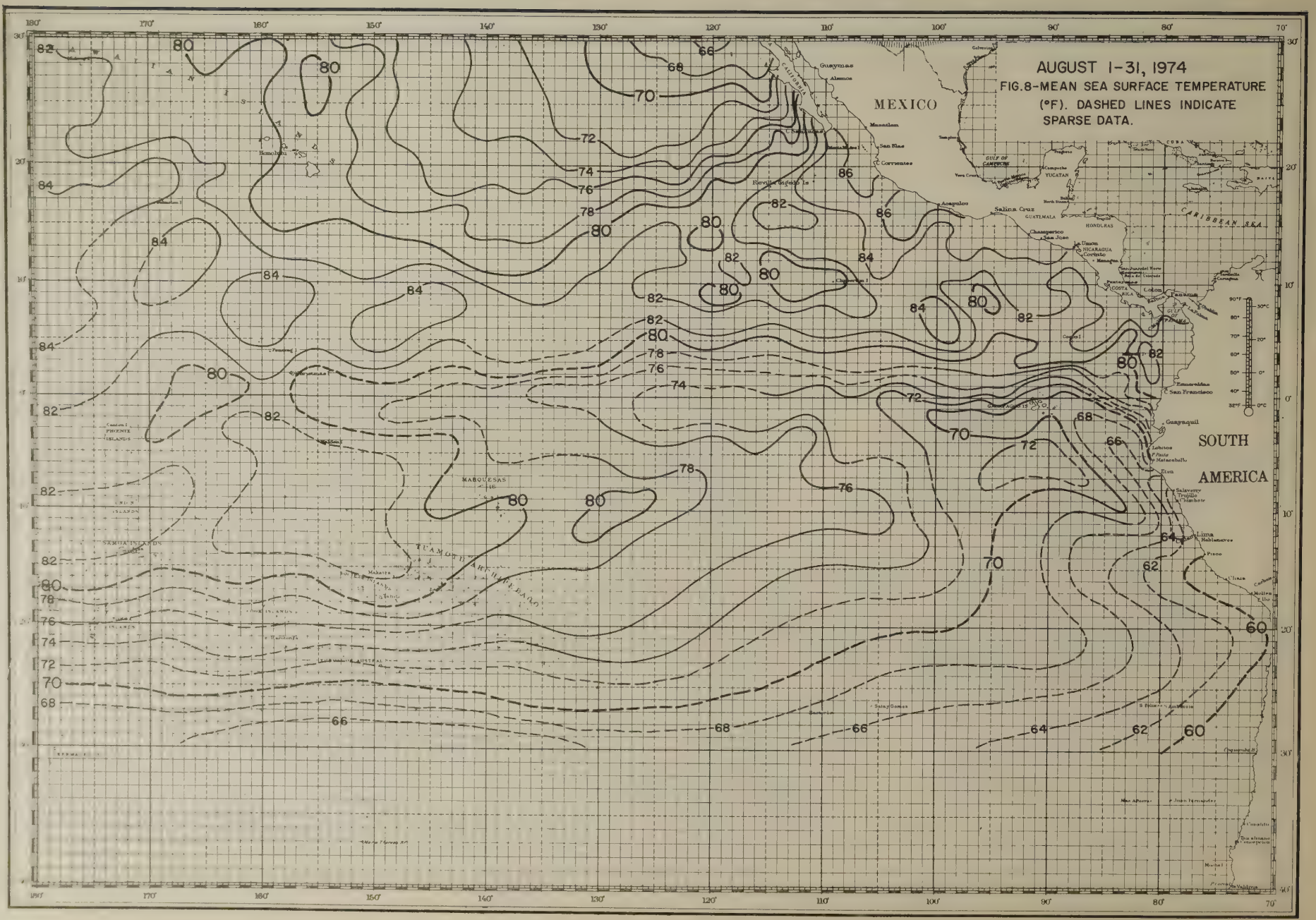
FIG. 4 - MEAN SEA SURFACE TEMPERATURE (°F)

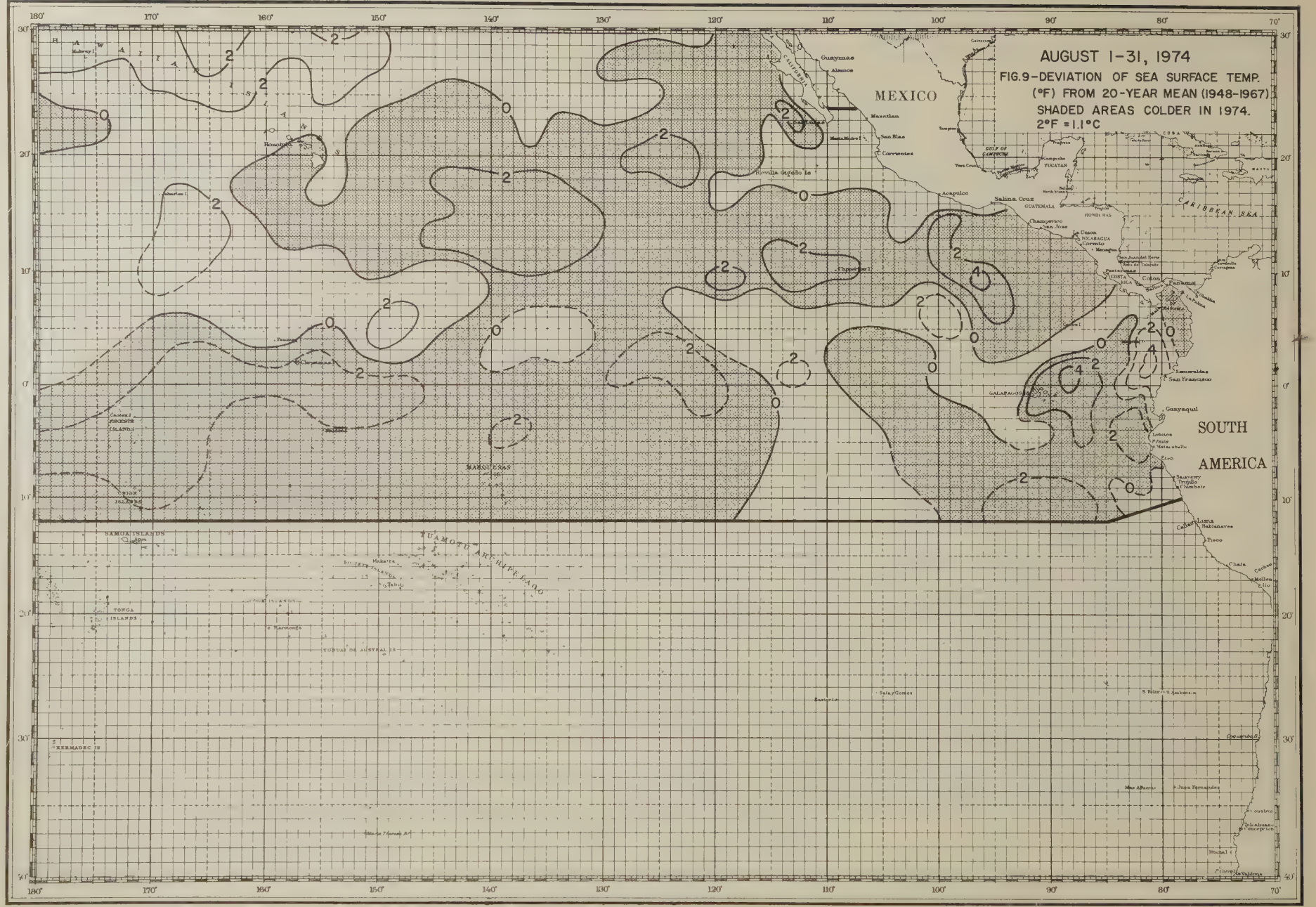


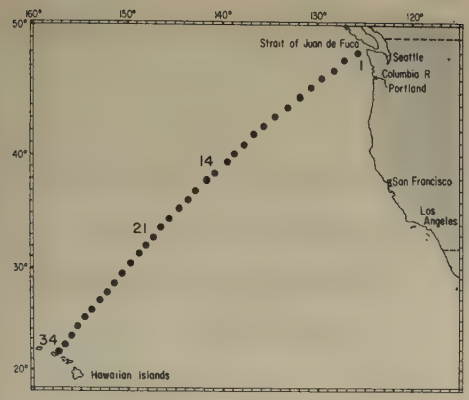

AUGUST 1-31, 1974
FIG.5 DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20 YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1974. 2° F = 1.1° C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
2


AUGUST 1-31, 1974
FIG.6-DEVIATION OF SEA SURFACE TEMP. (°F)
FROM 20 YEAR MEAN (1948-1967).
HATCHED AREAS COLDER IN 1974.
2°F = 1.1°C
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°
0
2
4


AUGUST 1-31, 1974
FIG.7 - DEVIATION OF SEA SURFACE TEMP. (°F) FROM AUGUST 1973. HATCHED AREAS COLDER IN 1974. 2°F=1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


AUGUST 1-31, 1974
FIG.8-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
CUBA
Guaymas
Mazatlan
San Blas
Acapulco
Salina Cruz
Guayaquil
Lima
Callao
Pisco
Salaverry
Trujillo
Chimbote
Esmeraldas
San Francisco
Colon
Panama
Cristobal
Puerto Cortes
Champerico
San Jose
Corinto
Manzanillo
Tampico
Veracruz
Progreso
Campeche
YUCATAN
Belize
Kingston
Haiti
Jamaica
Cienfuegos
Nuevitas
Santiago
Guantanamo
Port au Prince
Cape Haitien
Gulf of Tehuantepec
Gulf of Panama
Gulf of Guayaquil
Gulf of Mexico
Gulf of California
Revillagigedo Is.
Clipperton I.
Cocos I.
Malpelo I.
Galapagos Is.
MARQUESAS
TUAMOTU ARCHIPELAGO
SOCIETY ISLANDS
COOK ISLANDS
AUSTRAL ISLANDS
SAMOA ISLANDS
PHOENIX ISLANDS
LINE ISLANDS
Honolulu
Hawaiian Is.
Easter I.
Juan Fernandez Is.
Mas Afuera
Mas Tierra
San Felix
Arica
Iquique
Antofagasta
Coquimbo
Valparaiso
Mocha I.
Robinson Crusoe I.
Alexander Selkirk I.
Tres Marias Is.
Socorro I.
Roca Partida
Clarion I.
Guadalupe I.
Cedros I.
Isla Natividad
Isla Cedros
Isla Margarita
Isla Coiba
Isla Malpelo
Isla Gorgona
Isla Malaspina
Isla Plata
Isla Puna
Isla Lobitos
Isla Lobos de Tierra
Isla Lobos de Afuera
Isla Macabi
Isla Santa Clara
Isla Santa Maria
Isla Mocha
Isla Juan Fernandez
Isla Robinson Crusoe
Isla Alejandro Selkirk
Isla Pascua
Isla Sala y Gomez
Isla Desventuradas
Isla Salas y Gomez
Isla Clipperton
Isla Socorro
Isla Roca Partida
Isla Clarion
Isla Guadalupe
Isla Cedros
Isla Natividad


AUGUST 1-31, 1974
FIG.9-DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20-YEAR MEAN (1948-1967)
SHADED AREAS COLDER IN 1974.
2°F = 1.1°C
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GULF OF CALIFORNIA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
Guaymas
Mazatlan
San Blas
Acapulco
Salina Cruz
Guayaquil
Lima
Callao
Pisco
Chala
Mollendo
Arica
Iquique
Antofagasta
Coquimbo
Valparaiso
Talcahuano
Concepcion
Juan Fernandez
Easter I.
Galapagos Is.
Marquesas Is.
Tuamotu Archipelago
Tahiti
Samoa Islands
Tonga Islands
Kermadec Is.
Tubuai or Austral Is.
Sala y Gomez
S. Felix
S. Ambrosio
Honolulu
Hawaiian Is.
Midway I.
Johnston I.
Phoenix Islands
Line Islands
Tokelau Islands
Cook Islands
Society Islands
Makatea
Raratonga
Panama
Cristobal
Colon
Balboa
Esmeraldas
San Francisco
Tumaco
Buenaventura
Malpelo I.
Cocos I.
Chimbote
Trujillo
Salaverry
Callao
Pisco



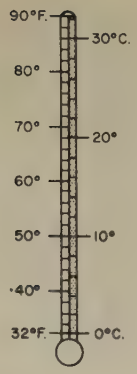


FIGURE 10

HONOLULU — SEATTLE

JULY 24-28, 1974

SS CALIFORNIAN

VOYAGE 245

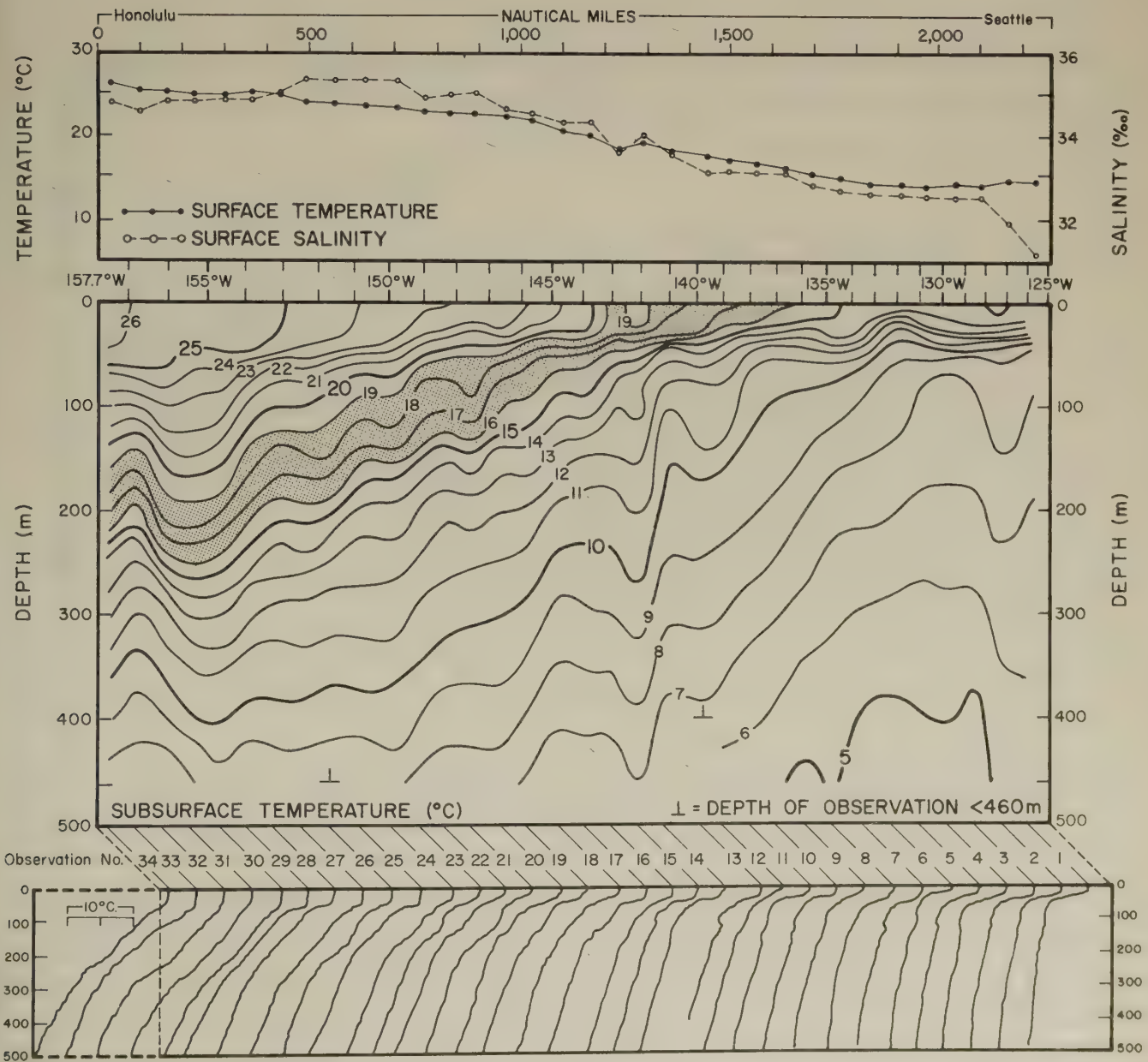
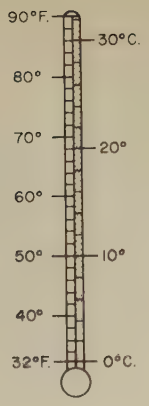


FIGURE 11



HONOLULU – SAN FRANCISCO

AUGUST 10-14, 1974

SS HAWAIIAN ENTERPRISE

VOYAGE 96

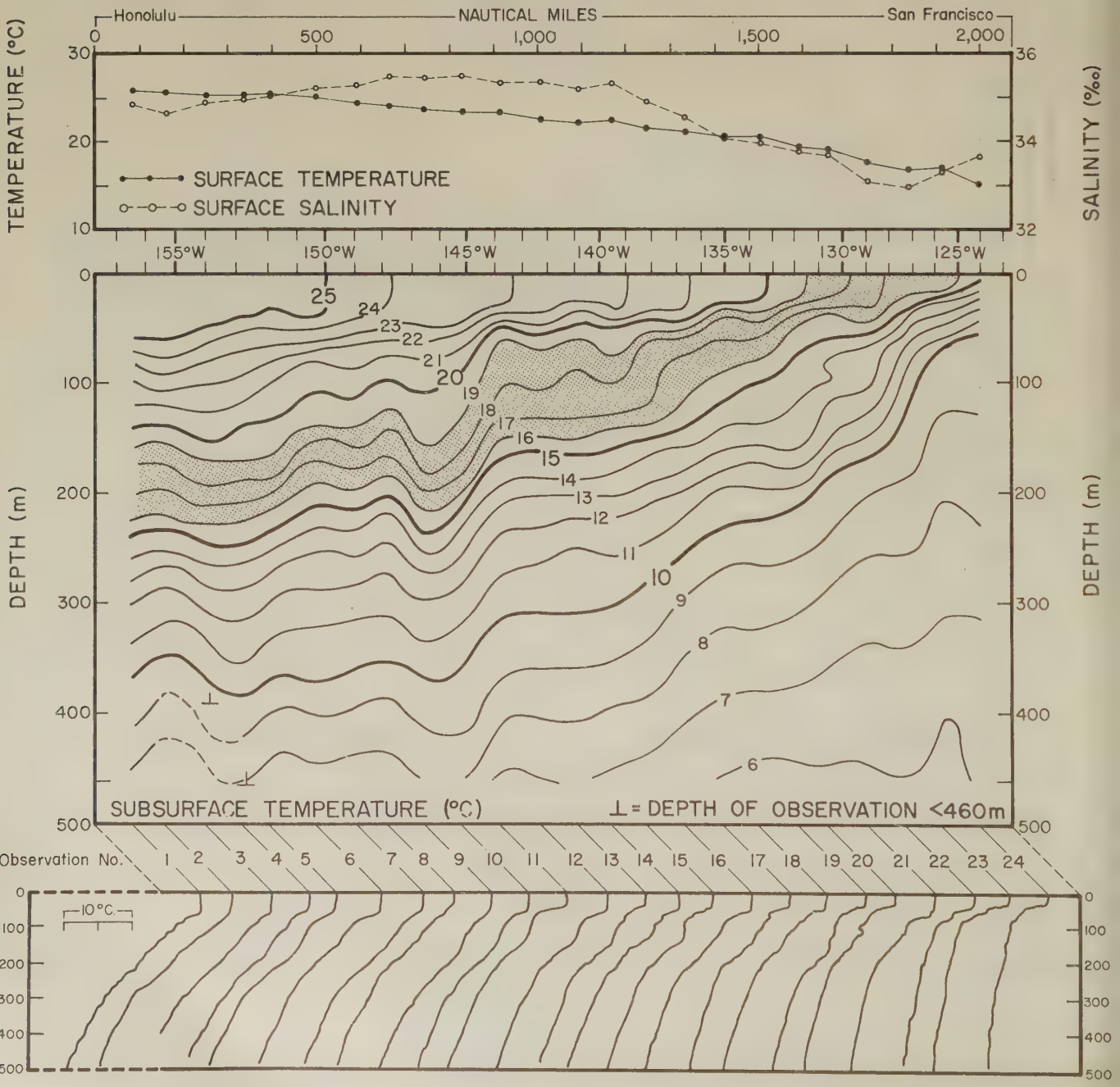
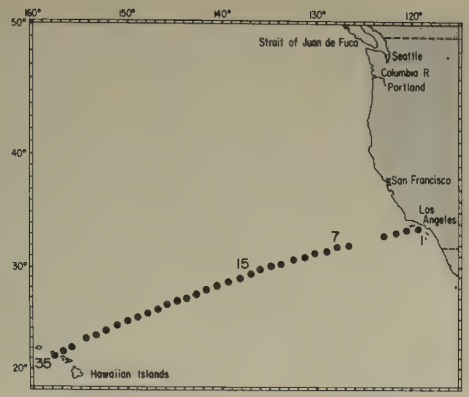
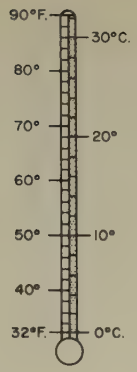


FIGURE 12





HONOLULU — LOS ANGELES

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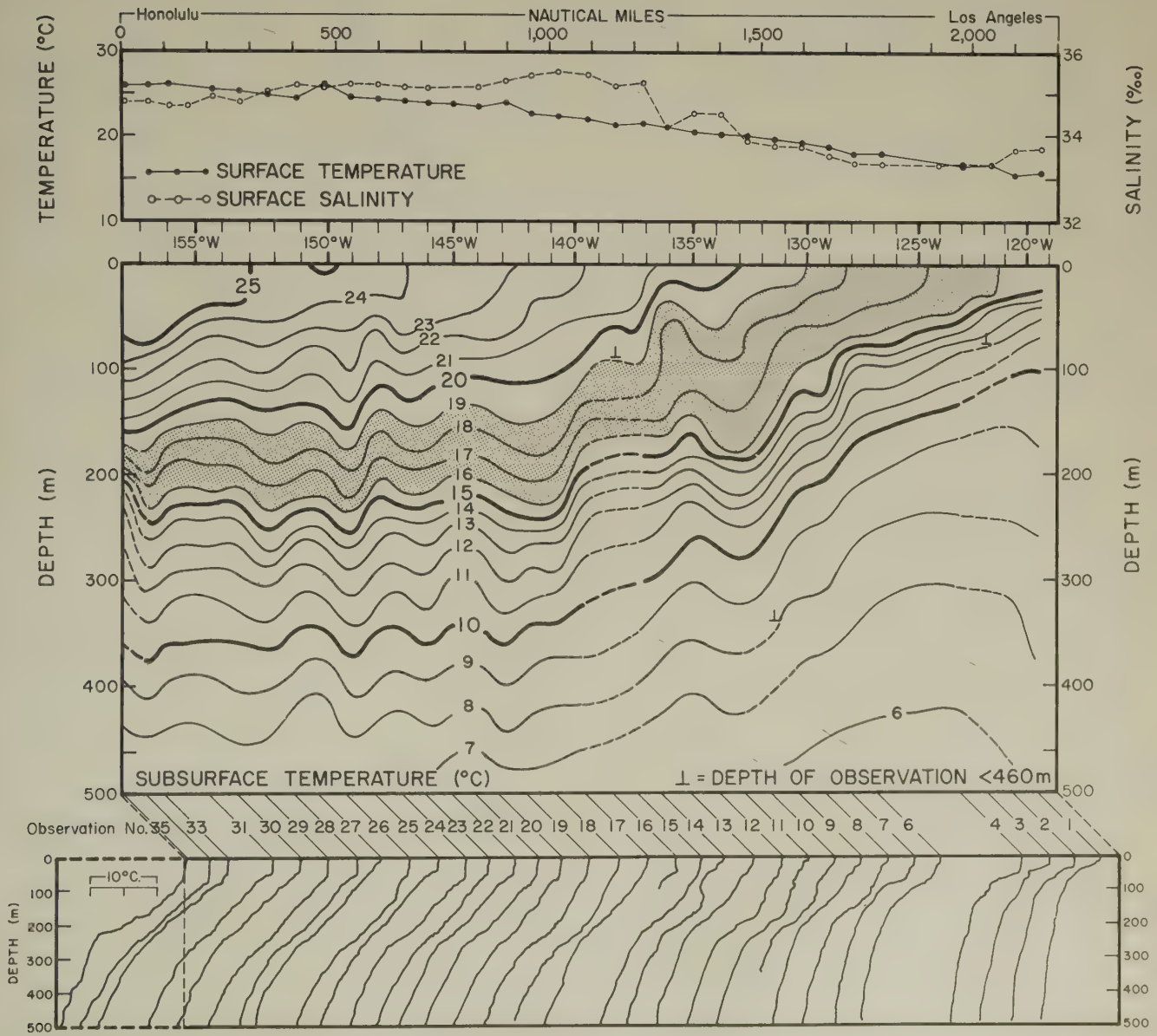
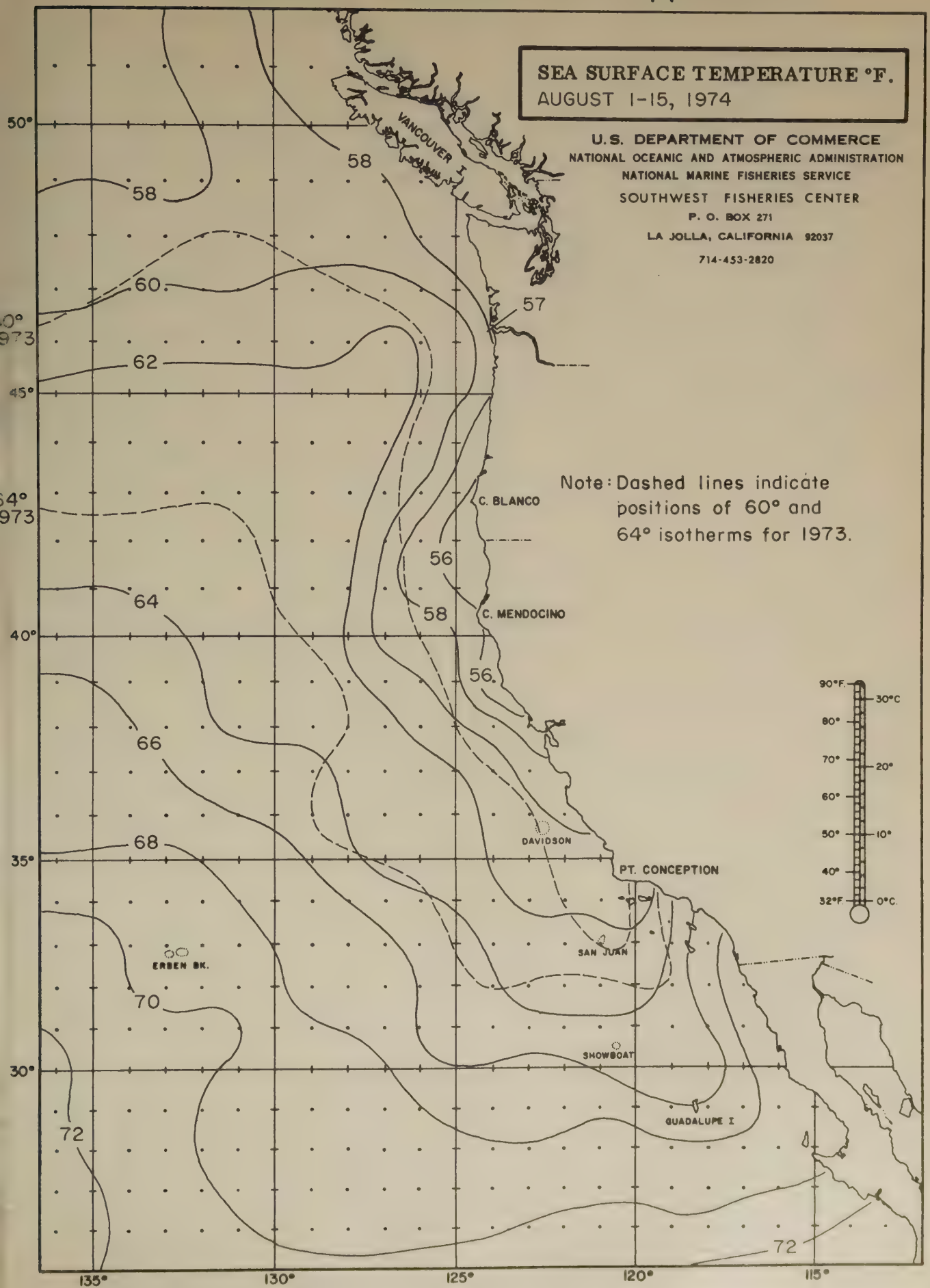
SS HAWAIIAN QUEEN

VOYAGE 144



FISHING INFORMATION – supplement



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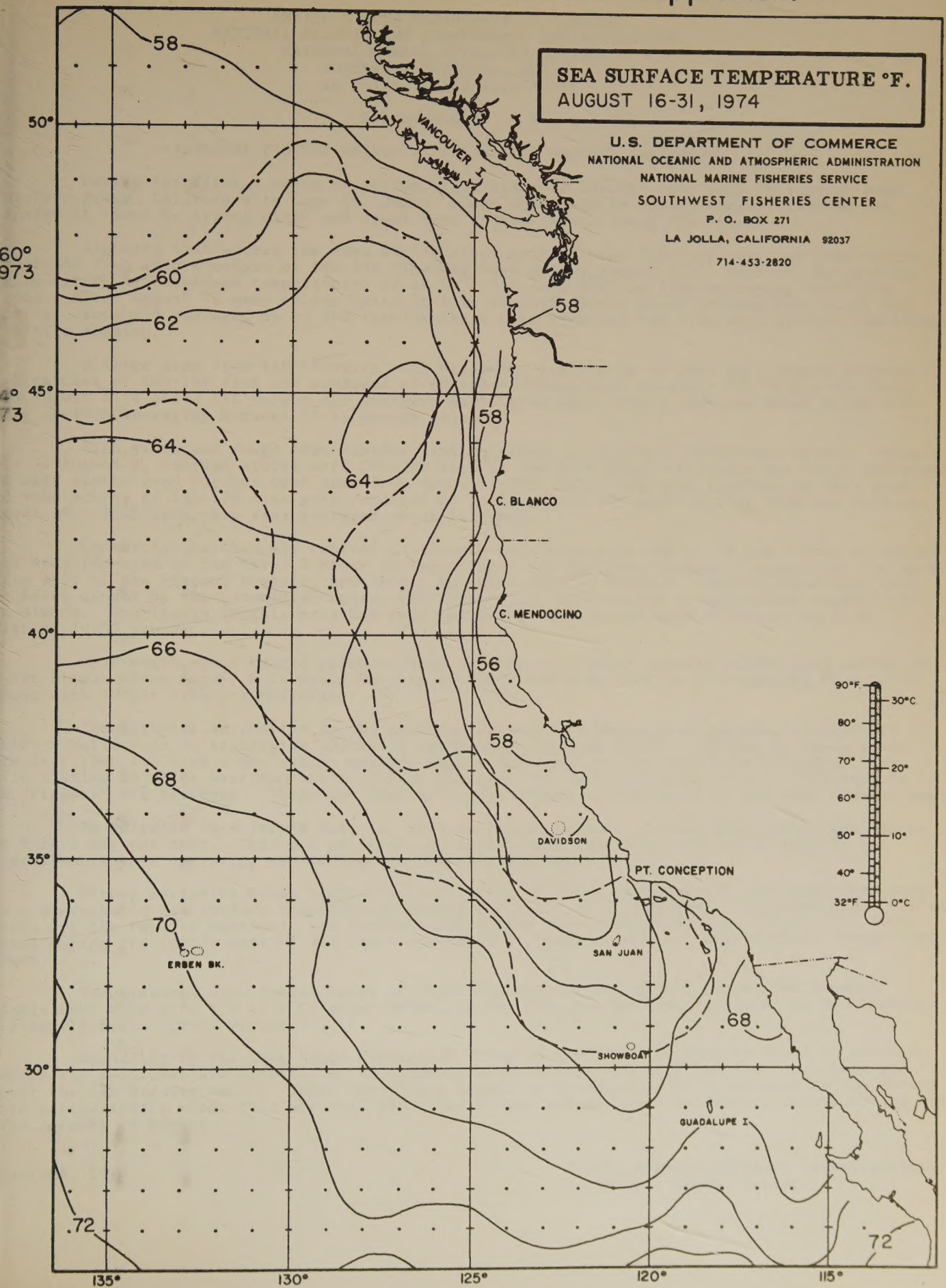

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
La Jolla, California 92037

BULLETIN No. 74-6

ALBACORE FISHERY MAINLY IN WATERS OFF PACIFIC NORTHWEST

During the first 2 weeks of August, good albacore catches were made in a broad area from Fort Bragg, California to Cape St. James, Queen Charlotte Islands; however, fishing was hampered at times by strong winds and rough seas in many areas along the coast.

Jigboats that worked the area 80-140 miles west of Cape Flattery reported good scores of 250-350 fish with averages of 100-200 fish per boat during August 4-7. Most of the fishing was in waters with surface temperatures of 58-60°F (14.4-15.6°C) on fish averaging about 11½ pounds. After August 7, many of the boats in this vicinity moved north between Cape Scott and Cape St. James and averaged up to 200 fish/day/boat with highs of 400 fish when weather conditions permitted fishing.

A large area from the "fingers" off Westport, Washington to Coos Bay, Oregon produced high catches of 200-500 fish and averages of 60-100 fish/day/boat to about 200 fish a day/boat. From August 8-14 boats off Oregon and southern Washington were fishing between 40-80 miles offshore on fish averaging between 11-14 pounds each.

High winds and rough seas limited fishing effort in northern California waters. From July 31-August 2, average scores were 100-200 fish in the Fort Bragg vicinity, but winds increased and only spotty good catches were made from August 3-15. Many fish were reported in this area and some scores of 150-170 fish were reported on August 6 and one catch of 350 fish was made on August 10. Fish from this area averaged about 11 pounds.

Commercial catches off central California were generally small. A few scores of 60-100 fish were reported in the first 2 weeks of August near the Davidson Seamount, Santa Cruz and 30-40 miles west of San Simeon; however, most boats had much smaller catches. Mostly mixed-size fish were being caught by the commercial boats, but larger fish were caught by sportboats working off San Simeon. Sportboats in this area had good catches in the second week of August on fish weighing 20-35 pounds.

Sportboats again caught albacore near the "60-mile Bank" and 295 fathom spot southwest of San Diego. From August 8-14 daily catches totaled from 8-86 fish on fish ranging from 12-30 pounds with larger fish predominating.

The jigboats on charter to the American Fishermen's Research Foundation scouted off northern California to Washington mostly in areas away from the fleet. Catches by these boats were less than 100 fish a day except between August 3-7 when one boat had over a hundred fish while fishing 80 miles west-southwest of Cape Flattery and from 120 miles west of Tillamook to the "fingers" off Westport. About 400 fish have been tagged and released by the AFRF charter boat.

In Bulletin 74-4 issued July 16, 1974, sportboat catches off San Diego were reported as 100 fish a day per boat. This was an error and should have read that the total catch by the several sportboats operating was as high as 200 fish per day.

Strong northerly winds along the coast north of Point Arena caused increased upwelling and a decrease in sea surface temperatures during the first half of August. Consequently, coastal waters off the Pacific Northwest and northern California that were as much as 2°F (1.1°C) above normal during the latter part of July have decreased to below normal or only slightly above normal values.

Temperatures also cooled south of Point Conception, and waters around the Channel Islands that were also 2°F (1.1°C) above normal during the last half of July are now near normal or slightly below normal values.

According to the Long Range Prediction Group of the National Weather Service, average atmospheric pressures are expected to be slightly below normal over the Pacific coast from mid-August through mid-September. These conditions should be accompanied by a decrease in the strong north-northwesterly winds that occurred along the Oregon and northern California coasts during the first 2 weeks of August.

August 15, 1974

Staff, Albacore Fishery Investigations
R. Michael Laurs, Leader